Claims

1. (currently amended) An antimicrobial composition for sustained treatment of dental unit water comprising a substantially dry mixture of effective amounts of a quaternary ammonium compound, an oxidizing agent, ~~and an antimicrobial metallic~~ a silver compound, and citric acid.

2. (original) The composition of claim 1, wherein the quaternary ammonium compound is selected from the group consisting of n-alkyl dimethyl benzyl ammonium chloride, n-alkyl dimethyl ethylbenzyl ammonium chloride, n-alkyl dimethyl 3,4-dichlorobenzyl ammonium chloride, dioctyl dimethyl ammonium chloride, didecyl dimethyl ammonium chloride, cetyl pyridinium chloride, and combinations thereof.

3. (original) The composition of claim 1, wherein the quaternary ammonium compound is present in a concentration of about 0.2% to about 40% by weight.

4. (original) The composition of claim 1, wherein the quaternary ammonium compound is present in a concentration of about 0.5% to about 20% by weight.

5. (original) The composition of claim 1, wherein the oxidizing agent forms hydrogen peroxide or a peroxyacid in solution.

6. (currently amended) The composition of claim 1, wherein the oxidizing agent is selected from the group consisting of sodium percarbonate, potassium peroxymonosulfate, sodium perborate monohydrate, sodium perborate hexahydrate, ~~calcium hypochlorite,~~ calcium peroxide, magnesium peroxide, urea peroxide, ~~sodium chlorite,~~ and combinations thereof.

7. (original) The composition of claim 1, wherein the oxidizing agent comprises sodium percarbonate.

8. (original) The composition of claim 1, wherein the oxidizing agent is present in a concentration of about 0.2% to about 20% by weight as active oxygen.

9. (original) The composition of claim 1, wherein the oxidizing agent is present in a concentration of about 0.5% to about 3% by weight as active oxygen.

10. (cancelled)

11. (currently amended) The composition of claim [[10]] 1, wherein the silver compound is selected from the group consisting of silver nitrate, silver nitrite, silver citrate, silver phosphate, silver benzoate, silver acetate, silver chlorate, silver chlorite, silver perchlorate, silver fluoride, silver sulfate, colloidal silver, and combinations thereof.

12. (currently amended) The composition of claim [[10]] 1, wherein the silver compound is present in a concentration of about 0.02% to about 1.5% by weight as silver.

13. (currently amended) The composition of claim [[10]] 1, wherein the silver compound is present in a concentration of about 0.05% to about 0.5% by weight as silver.

14-15. (cancelled)

16. (currently amended) The composition of claim [[14]] 1, wherein the ~~chelating/coordinating compound~~ citric acid is present in a concentration of about 2% to about 75% by weight.

17. (cancelled)

18. (original) The composition of claim 1, wherein the composition is in tablet form.

19. (original) The composition of claim 18, wherein the quaternary ammonium compound is selected from the group consisting of n-alkyl dimethyl benzyl ammonium chloride, n-alkyl dimethyl ethylbenzyl ammonium chloride, n-alkyl dimethyl 3,4-dichlorobenzyl ammonium chloride, dioctyl dimethyl ammonium chloride, didecyl dimethyl ammonium chloride, cetyl pyridinium chloride, and combinations thereof.

20. (original) The composition of claim 18, wherein the oxidizing agent forms hydrogen peroxide or a peroxyacid in solution.

21. (currently amended) The composition of claim 18, wherein the oxidizing agent is selected from the group consisting of sodium percarbonate, potassium peroxymonosulfate, sodium perborate monohydrate, sodium perborate hexahydrate, ~~calcium hypochlorite,~~ calcium peroxide, magnesium peroxide, urea peroxide, ~~sodium chlorite,~~ and combinations thereof.

22. (original) The composition of claim 18, wherein the oxidizing agent comprises sodium percarbonate.

23. (currently amended) The composition of claim 18, wherein the ~~antimicrobial metallic compound is a~~ silver compound is selected from the group consisting of silver nitrate, silver nitrite, silver citrate, silver phosphate, silver benzoate, silver acetate, silver chlorate, silver chlorite, silver perchlorate, silver fluoride, silver sulfate, colloidal silver, and combinations thereof.

24-28. (cancelled)

29. (currently amended) The composition of claim 18, wherein the oxidizing agent ~~28, further comprising a compound that~~ reacts with citric acid in solution to produce effervescence.

30. (currently amended) An antimicrobial composition for sustained treatment of dental unit water comprising a substantially moisture-free mixture of effective amounts of a quaternary

ammonium compound, an oxidizing agent, ~~and an antimicrobial metallic~~ a silver compound, and citric acid.

31. (currently amended) An antimicrobial composition comprising:

from about 0.2% to about 40% by weight of a quaternary ammonium compound;

from about 0.2% to about 20% by weight as active oxygen of an oxidizing agent; ~~and~~

from about 0.02% to about 1.5% by weight as silver of a silver compound; and

from about 2% to about 75% by weight of citric acid.

32-33. (cancelled)

34. (original) The composition of claim 31, wherein the composition is in tablet form.

35. (cancelled)

36. (currently amended) A method for causing sustained antimicrobial activity in a water supply comprising:

providing a substantially dry composition comprising effective amounts of a quaternary ammonium compound, an oxidizing agent, ~~and an antimicrobial metallic~~ a silver compound, and citric acid; and

forming a mixture comprising water and said composition.

37. (currently amended) ~~The method of claim 36,~~ A method for causing sustained antimicrobial activity in a water supply comprising:

providing a substantially dry composition comprising effective amounts of a quaternary ammonium compound, an oxidizing agent, and an antimicrobial metallic compound; and

forming a mixture comprising water and said composition, wherein the mixture is formed in a dental unit reservoir.

38. (currently amended) The method of claim 37, further comprising cleaning ~~the biofilms~~ biofilm from the dental unit before forming the mixture in the dental unit reservoir.

39. (currently amended) The method of claim 38, wherein cleaning ~~the biofilms~~ biofilm from the dental unit comprises performing a shock treatment.

40. (currently amended) ~~The method of claim 36,~~ A method for causing sustained antimicrobial activity in a water supply comprising:

providing a substantially dry composition comprising effective amounts of a quaternary ammonium compound, an oxidizing agent, and an antimicrobial metallic compound;

forming a mixture comprising water and said composition; and

~~further comprising~~ introducing the mixture into a dental unit reservoir.

41. (currently amended) The method of claim 40, further comprising cleaning ~~the biofilms~~ biofilm from the dental unit before introducing the mixture into the dental unit reservoir.

42. (currently amended) The method of claim 41, wherein cleaning ~~the biofilms~~ biofilm from the dental unit comprises performing a shock treatment.

43. (currently amended) ~~The method of claim 36,~~ A method for causing sustained antimicrobial activity in a water supply comprising:

providing a substantially dry composition comprising effective amounts of a quaternary ammonium compound, an oxidizing agent, and an antimicrobial metallic compound;

forming a mixture comprising water and said composition; and

~~further comprising~~ performing a dental treatment on a patient in which the patient comes in contact with the mixture.

44. (currently amended) The method of claim 36, wherein the mixture comprises:

from about 0.2 mg/L to about 20 mg/L of [[a]] the quaternary ammonium compound;

from about 0.2 mg/L to about 20 mg/L as active oxygen of [[an]] the oxidizing agent; ~~and~~

from about 0.02 mg/L to about 1.5 mg/L as silver of [[a]] the silver compound; and

from about 2% to about 75% by weight of the citric acid.

45. (currently amended) The method of claim 36, wherein the mixture comprises:

from about 0.5 mg/L to about 10 mg/L of [[a]] the quaternary ammonium compound;

from about 0.5 mg/L to about 3 mg/L as active oxygen of [[an]] the oxidizing agent; ~~and~~

from about 0.05 mg/L to about 0.5 mg/L as silver of [[a]] the silver compound; and

from about 2% to about 75% by weight of the citric acid.

46. (original) A method for causing sustained antimicrobial activity in a dental unit water supply comprising:

providing a tablet comprising effective amounts of a quaternary ammonium compound, an oxidizing agent, a silver compound, and citric acid; and

forming a mixture comprising water and at least a portion of the tablet.

47. (original) The method of claim 46, wherein forming a mixture includes adding at least a portion of the tablet to a dental unit reservoir, further comprising allowing the mixture to effervesce.

48. (original) The method of claim 47, wherein the mixture is ready for use in dental treatment within fifteen minutes after adding at least a portion of the tablet to the dental unit reservoir.

49. (original) The method of claim 46, wherein the mixture is formed in a dental unit reservoir.

50. (currently amended) The method of claim 49, further comprising cleaning ~~the biofilms~~ biofilm from the dental unit before forming the mixture in the dental unit reservoir.

51. (currently amended) The method of claim 50, wherein cleaning ~~the biofilms~~ biofilm from the dental unit comprises performing a shock treatment.

52. (original) The method of claim 46, further comprising introducing the mixture into a dental unit reservoir.

53. (currently amended) The method of claim 52, further comprising cleaning ~~the biofilms~~ biofilm from the dental unit before introducing the mixture into the dental unit reservoir.

54. (currently amended) The method of claim 53, wherein cleaning ~~the biofilms~~ biofilm from the dental unit comprises performing a shock treatment.

55. (original) The method of claim 46, further comprising performing a dental treatment on a patient in which the patient comes in contact with the mixture.

56. (original) The method of claim 46, wherein the mixture comprises:
from about 0.2 mg/L to about 20 mg/L of a quaternary ammonium compound;
from about 0.2 mg/L to about 20 mg/L as active oxygen of an oxidizing agent; and
from about 0.02 mg/L to about 1.5 mg/L as silver of a silver compound.

57. (original) The method of claim 46, wherein the mixture comprises:
from about 0.5 mg/L to about 10 mg/L of a quaternary ammonium compound;
from about 0.5 mg/L to about 3 mg/L as active oxygen of an oxidizing agent; and
from about 0.05 mg/L to about 0.5 mg/L as silver of a silver compound.

58. (currently amended) A method for making a composition comprising:
providing a quaternary ammonium compound;
providing an oxidizing agent;
providing ~~an antimicrobial metallic~~ a silver compound; ~~and~~
providing citric acid; and

forming at least the quaternary ammonium compound, oxidizing agent, silver ~~and antimicrobial metallic~~ compound, and citric acid into a tablet.

59-65. (cancelled)

66. (new) The method of claim 37, further comprising maintaining the microbial contamination in the dental unit reservoir at less than 0.05 log (CFU/mL) for at least five consecutive days.

67. (new) The method of claim 37, wherein forming the mixture comprises adding the composition to the dental unit reservoir once daily for at least five consecutive days.

68. (new) The method of claim 37, further comprising substantially inhibiting the growth of biofilm in a dental unit water system connected to the dental unit reservoir.

69. (new) The method of claim 37, wherein the composition is in tablet form.

70. (new) The method of claim 37, wherein the mixture is acidic.

71. (new) The method of claim 37, wherein the composition further comprises citric acid.

72. (new) The method of claim 71, wherein the oxidizing agent reacts with the citric acid in solution to produce effervescence.

73. (new) The method of claim 40, further comprising maintaining the microbial contamination in the dental unit reservoir at less than 0.05 log (CFU/mL) for at least five consecutive days.

74. (new) The method of claim 40, further comprising substantially inhibiting the growth of biofilm in a dental unit water system connected to the dental unit reservoir.

75. (new) The method of claim 40, wherein the composition is in tablet form.

76. (new) The method of claim 40, wherein the mixture is acidic.

77. (new) The method of claim 40, wherein the composition further comprises citric acid.

78. (new) The method of claim 77, wherein the oxidizing agent reacts with the citric acid in solution to produce effervescence.

79. (new) The method of claim 43, wherein the composition is in tablet form.

80. (new) The method of claim 43, wherein the mixture is acidic.

81. (new) The method of claim 43, wherein the composition further comprises citric acid.

82. (new) The method of claim 81, wherein the oxidizing agent reacts with the citric acid in solution to produce effervescence.

83. (new) The method of claim 46, wherein the mixture is acidic.

84. (new) The method of claim 46, further comprising maintaining the microbial contamination in the dental unit water supply at less than 0.05 log (CFU/mL) for at least five consecutive days.

85. (new) The method of claim 46, wherein the oxidizing agent reacts with the citric acid in solution to produce effervescence.